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MAKING THE MEANING OF CONTRACTS VISIBLE – AUTOMATING CONTRACT VISUALIZATION

Stefania Passera¹, Helena Haapio², Michael Curtotti³

¹PhD Researcher, Aalto University School of Science, Department of Industrial Management and Engineering
Betonimiehenkuja 5C, 02150, Espoo, FI
stefania.passera@aalto.fi; <http://legaldesignjam.com>

²Business Law Teacher & Postdoctoral Researcher, University of Vaasa / International Contract Counsel, Lexpert Ltd
Pohjoisranta 20, 00170 Helsinki, FI
Helena.Haapio@lexpert.com; <http://www.lexpert.com>

³PhD Researcher, Australian National University, Research School of Computer Science, Legal Counsel, ANU Students' Association & ANU Postgraduate and Research Students' Association
Building 17a Student Facilities Building, Union Court, Australian National University, ACTON, ACT 0200, Australia
Michael.Curtotti@anu.edu.au

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Abstract: *Today's contracts are complex and their meaning is not always clear to those who are impacted. What can we do to provide transparency and understandability and to prevent inadvertent non-compliance and negative surprises? In our previous work, we have brought information design, user experience, readability, visualization and natural language processing to bear on exploring the use of non-textual devices in contracts and other legal documents. This paper seeks to make contract/legal rule visualization accessible to a wider audience. As the production of contract/legal visualizations can be a challenge, we propose and demonstrate prototypes of automated tools for such visualizations. In this paper, we experiment with computer-generated visualizations of selected contract clauses. Our early prototypes include common types of term and termination, payment and liquidated damages clauses. These examples provide proof-of-concept demonstration tools that help contract writers present content in a way readers pay attention to and understand. In addition, these tools can help them produce better content through self-audits, as visuals can help detect and clarify ambiguities and unintended interpretation. These results point to the possibility of document assembly engines compiling an entirely new genre of contracts, more user-friendly and transparent for readers and not too challenging to produce for lawyers.*

1. Introduction

The amount of information we are required to process every day, on the workplace and beyond, is constantly increasing. There is a demand not only for information to be accessible, but also to be presented in effective ways that are transparent, clear, and easy to understand for the reader. Today's contracts are complex and their meaning is not always clear to those who are impacted. This is not an issue limited to consumer contracts alone, it also affects public procurement and business-to-business contracts. As the complexity and the pace of communication increase, there is a growing need to become more sophisticated and strategic in crafting documents. While the benefit for the readers is clear, this also raises expectations about the expertise and skills of document producers.

This paper seeks to introduce contract/legal rule visualization to a wider audience. While recent research has started to build evidence that contracts can be made faster to read and clearer through visualization [Passera, 2012; Passera et al, 2013], the practical issue of who would produce such visualizations has remained open, calling for either the development of new visual communication skills for contract drafters, new ways to collaborate with designers, or the need for new drafting tools. The latter is the approach we explore in this paper, as we wish to demonstrate the conceptual and practical value of automated tools that can help drafters to make the meaning of their contracts clearer.

The scenario of use we concentrate on is commercial business-to-business (B2B) contracts, with sales and purchasing managers as the main expected user groups. In B2B contracts many clauses focus on business deliverables, processes and outcomes, rather than on legal terms. The expertise of business managers is thus vital when drafting such clauses, as contracts can function as helpful *planning mechanisms* [Macneil & Gudel, 2001] and as *blueprints for performance* [e.g., DiMatteo, Siedel & Haapio, 2012]. In this paper we present three demos of automated contract tools (term and termination; payment terms; and liquidated damages for delay in delivery) that can help drafters – managers as well as lawyers – produce contract texts and visualizations with minimum effort, just by focusing on clarifying the operative details of the deal.

2. Contract Visualization and Automation: the Benefits

B2B contracts are complex. Their production involves several departments and diverse groups of experts. Despite best efforts, sharing meanings and understanding across different professional communities is a challenge: in Von Hippel’s words [1994], knowledge is “sticky” and difficult to transfer, partly because it is tacit, partly because it is not encoded in a way that subjects external to a specific community can readily use. The same phenomenon is addressed by Eppler [2004], when he identifies “chasms of knowledge” existing between experts and managers and suggests that they can be bridged only through deliberate, interactive communication activities aimed at conveying and co-constructing insights, assessments, experiences and skills through verbal or non-verbal means.

The way contracts are mostly written and presented ignores the fact that lawyers are not their only readers and users and that legal expertise is only one of the types of expertise needed to draft and implement a successful deal and relationship. While we still need enforceable legal protection in contracts, we also need to make contracts functional in all everyday business-as-usual implementation scenarios outside of the courtroom. Integrating visualization into contract text allows to open up their meaning to all those for whom “legalese” is challenging, increasing the odds of different actors engaging with the text and understanding it. This not only acknowledges the fact that different people have different preferred cognitive styles to process information [Blazhenkova & Kozhevnikov, 2009], but also builds on specific advantageous peculiarities of visual communication. Yet producing visual communication can be a challenge. In the following, we introduce the rationale upon which we build our case in favor of contract visualization and the automation of drafting practices.

2.1. Benefits of Visualization

There are many benefits to visualization, by which we mean the display of information in a visual format, thus adding infographics, charts, icons or images to supplement text. Firstly, visualization helps different parties to articulate tacit assumptions, as by nature it requires an explicit encoding that makes abstract concepts easier to grasp [Kirsch, 2010]. The different mental models of different parties are made into shareable, externalized objects for thought, which can be compared, discussed and aligned. Secondly, integrating texts with visualizations distributes the cognitive load on different information processing systems, preventing information overload [Keller & Grimm, 2005].

Studies show how the visual display of information supports better understanding and memorization in comparison to plain prose [Wright & Reid, 1973] and how the way information is designed affects decision-making [Wright, 2009] and subjective perception of how usable an interface is [Tractinsky, Katz, & Ikar, 2000]. Thirdly, providing visual structure and visual cues supports readers in their reading strategies, reducing the chances of misinterpretation, as *paralanguage* (e.g. voice stresses and modulation, body language) does in spoken language [Waller, 1987].

Visualization can play an important role in contracting, as it is crucial for the parties to avoid misunderstandings and inadvertent non-compliance. This, however, has to be seen as an ongoing, common sensemaking process between the parties, starting already at the negotiation stage. By using visualizations the parties can, for instance, better illustrate their expectations on each others' responsibilities during the pre-award phase, fostering mutual trust and commitment [Haddad, 2013]. Contract visualization can be seen as a way to implement a proactive approach to contracting [Siedel & Haapio, 2010; Haapio, 2013], as it not only aims to prevent disputes and litigation, but also to enhance the likelihood of successful business outcomes and a mutually beneficial relationship for both parties.

2.2. Benefits of Automation

Document automation has a significant history and usage in the legal field, finding expression particularly in automated document assembly. Lauritsen [1998] describes the basic features of then available document assembly software. The essential feature of these systems is their ability to provide means for input of data, storage of and output of contract variables such as for example parties, pricing or alternative contract provisions automatically generated on the basis of provided facts. Systems range from simple macros embedded in word processing packages to complex commercial products backed by databases and logical rules.

The benefits of such systems is confirmed by their significant adoption by the legal industry. The survey of technology use by the International Legal Technology Association [ILTA, 2013] finds for example that 38% of law firms surveyed used document assembly software. 76% of firms reported using templating or macro systems (which represent simpler document automation solutions). The survey represented 494 firms and 88000 lawyers. In their 2011 survey [ILTA, 2011] of 54 in-house law departments covering a broad range of industries ILTA notes that 70% use Microsoft Word as their document assembly software, with specialised document assembly programs coming second and third. Other sources report that many corporations have moved from manual drafting to automated contract assembly and developed their own computer-based drafting systems [Adams, 2009; Quinn & Adams 2007]. Interestingly in 2007, Lauritsen [2007] notes that as yet only the most elementary visualization interfaces had been tapped.

The approaches outlined to data capture and document assembly, which are already widespread in commercial legal practice, we here demonstrate, can readily be adapted to the production of visual expressions of contract terms. This represents the potential to significantly reduce 'entry barriers' for document designers wishing to incorporate contract visualizations. Such designers can simply use widely accepted methods of data input, which can be expressed as clause visualizations.

3. Demos of Automated Tools for Contract Visualization

In this paper we present three examples of automated tools for contract visualization. Each tool generates a visualization, which may be accompanied by text for a specific clause (term and termination; payment terms; and liquidated damages for delay in delivery), based on the input provided by the user, through multiple choices or by filling in form fields. The clauses were selected because

they are commonly found in B2B contracts in different industries, thus making these demos useful for a large user base.

Despite not providing a comprehensive set of tools for drafting contracts, the demos show how ideally a complete “Automated Contract Visualization Tool” could be created and how automation can simplify the production of visualizations. The solution is flexible and modular, as different palettes, including different selections of suitable tools, could be created in order to reflect the content and structure of typical contracts used in specific industries. This would allow users to just have a selection of tools that are suitable for their needs, without getting overwhelmed by the fact of having to choose the right tools for their contract, among many choices. Additionally, users could create their own customized palettes, choosing the tools that best suit the drafting of the contract they have in mind.

All demos can be tested here: <http://cs.anu.edu.au/people/Michael.Curtotti/visualcontracting/>

3.1. Term and Termination

This first automated tool builds on previous examples showing how duration and termination of agreements can be easily visualized through timelines [Passera, Haapio & Barton, 2013; Passera & Haapio, 2011]. Critical events, such as the start and the end of the agreement, as well as deadlines for renewing or terminating the agreement, are given visual relevance, being marked as “milestones” along the timeline (Figure 1). Different colours are used to create visual structure, as a change in colour signifies a change in meaning (e.g. in Figure 1, the black line represents the minimum duration of the agreement, during which it is not possible to terminate it, while the red line represents the period during which termination is possible, with a notice period). The data needed to create the text and the visualization is provided through a simple and intuitive interface (Figure 2), which prompts the user to think about the duration in concrete terms, through simple questions.

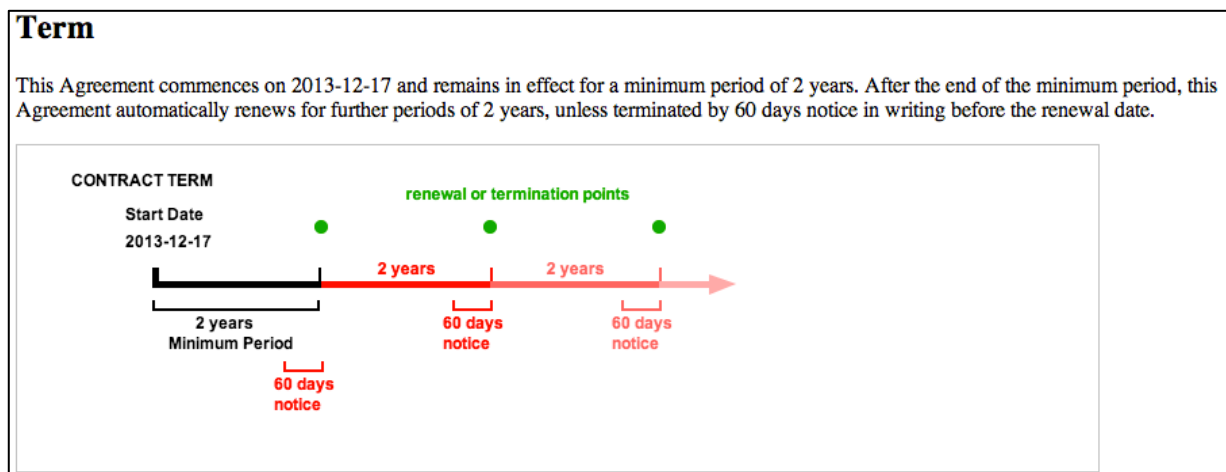


Figure 1: Timeline visualization showing the term and termination (along with renewal points) of the agreement

Contract Term

17 / 12 / 2013 Start Date

2 Term days months years

Can the contract be terminated with notice?

60 Notice Period in Days

Does the contract have a minimum period?

2 Minimum Period

days months years

Does the contract automatically renew for further periods?

2 Renewal Period

days months years

Figure 2: Input window of the above timeline visualization showing what information the user is asked for

3.2. Payment

The second automated tool tries to help the parties to communicate and understand the payment model adopted in a contract. In our demo we showcase two models of payment: the first is payment in instalments, when the total purchase price is divided in parts that become due upon specific milestones in the delivery (Figure 3); the second is payment based on production, in which the price is calculated on the units produced over a period of time, multiplied by a fee (Figure 4).



Figure 3: Input window and visualization of a payment clause: payment due in 6 instalments

Payment Clause

Payment By Instalment Payment By Production

Frequency of Billing

Price per unit of production \$

Is there a periodic minimum payment?
 Is there a penalty for failing minimum production?

Minimum no of units:

Production penalty \$

Is there a bonus production level?

Production Bonus in units:

Production Bonus \$

weekly payment based on production

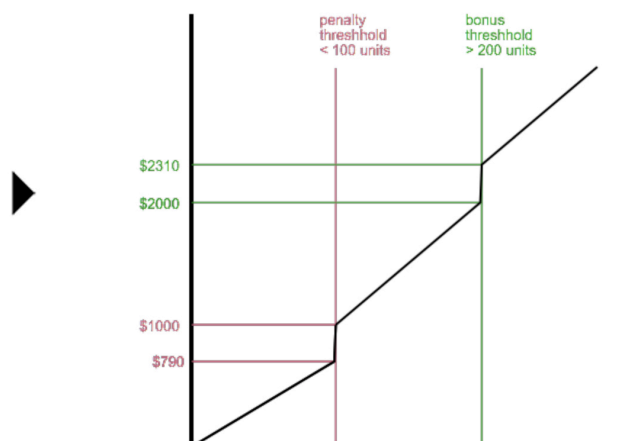


Figure 4: Input window and visualization of a production-based payment clause. The visualization shows how the price and payment are affected by bonuses for exceeding or penalties for not meeting agreed production levels

By analyzing different contracts from different industries, it is possible to identify more payment types and add them as options in this automated tool. The pricing models shown in this demo were chosen because they can be used for pricing either industrial goods or industrial services, thus covering many B2B contract situations.

3.3. Liquidated Damages for Delay in Delivery

The third automated tool visualizes liquidated damages for delay in delivery. The user has the possibility to craft customized terms and visualizations applying certain simple scenarios or to choose a ready-made provision from a set of existing standard terms and conditions for a given industry. Our example in Figure 5 demonstrates the visualization of part of a liquidated damages clause included in the General Conditions for the Supply of Machinery and other Mechanical, Electrical and Electronic Equipment issued by the Nordic organizations for the engineering industries, NL 01. In a more extended version of the demo, other alternative standard terms issued by organizations such as ORGALIME or FIDIC could be included.

The online tool also offers the possibility to create a customized liquidated damages clause. The visualization could be further elaborated to help not only in understanding liquidated damages in currency rather than percentage, but also to communicate when liquidated damages are exclusive (as in NL 01) or there are additional remedies. In the latter scenario, the purchaser has also a right to damages.

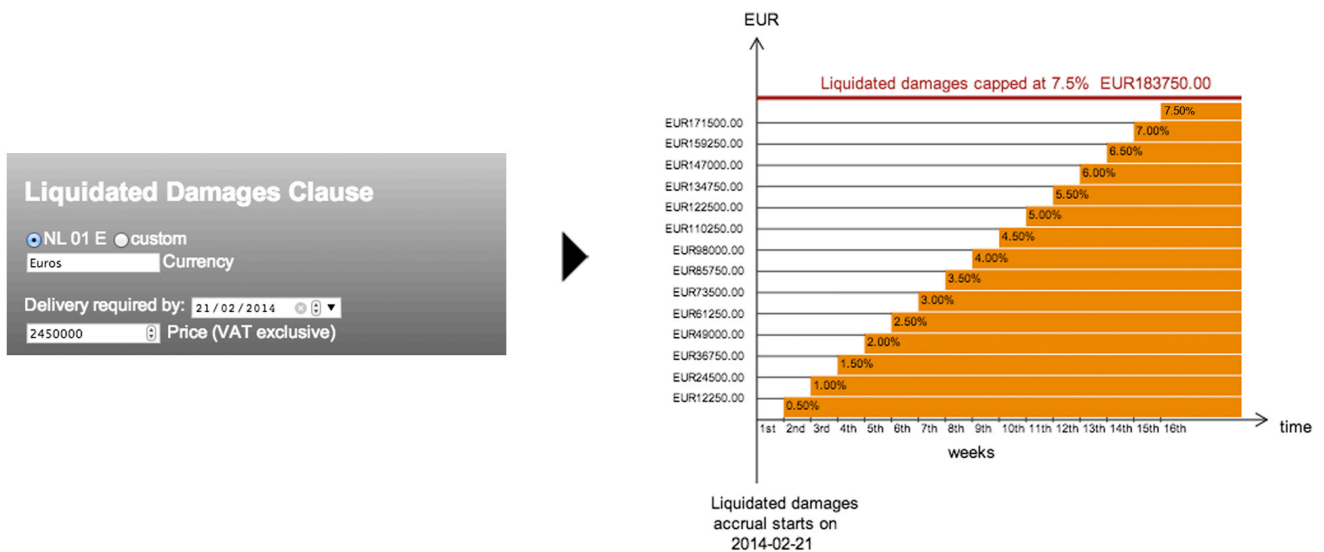


Figure 5: Visualization of the liquidated damages clause in NL 01 General Conditions¹

¹ According to NL01 General Conditions, liquidated damages are payable at a rate of 0.5% of the agreed price for each complete week of delay and shall not exceed 7.5%. In our visual example, we chose not to show what happens if the maximum liquidated damages are reached and the goods are still not delivered. Then the Buyer may, following an agreed process, terminate the contract and claim damages for the loss that exceeds the maximum liquidated damages, up to an additional 7.5% of the price. In these General Conditions, all other claims in respect of the Seller's delay are excluded, except, however, where the Seller has been guilty of gross negligence.

4. Discussion and Conclusions

The experience of developing prototypes of automated tools for contract visualization allowed us to reflect on different scenarios with different consequences. Visualization does not only affect individual understanding and interpersonal knowledge sharing and sensemaking, it also changes current drafting practices toward a more user-centred attitude.

In order to design and code the automated tools demos, we first had to deconstruct existing clauses, comparing and contrasting similarities and differences in how a certain provision was treated and drafted in different contracts. Once we had smaller pieces of information, we mapped what constituted key information at the core of the clause (e.g., in reference to the term and termination clause, what are the start and end dates of the agreement? What is the notice period to terminate the agreement?) and what constituted additional options (e.g., can the agreement be renewed? Is there a minimum term?).

After that, two important steps were done simultaneously and iteratively: on one hand, in order to create the user interface, we tried to translate all options into questions directed to the user, so as to obtain all needed data to generate the automated visualization; on the other hand, we searched for “visual archetypes” that with minimal changes could represent effectively and clearly all possible combinations of different options. Trial and error were needed to ensure that the visualizations generated from different data would look clearly different from each other, and that the questions (the way to get the data necessary for the visualization) would be understandable for users.

From the demo users’ perspective, with the use of automated tools, contract drafting becomes an interactive activity, focused on prefiguring and thinking what the different clauses actually mean and how to implement them in practice. When the other party is involved in discussing and editing the visualizations, a process of true “trialogic learning” can develop, as the parties co-create and shape their common understanding by interacting and manipulating the visualization as a shared object of activity [Paavola & Hakkarainen, 2005]. This encourages interaction, and, at the same time, opens up a possibility of systematically designing tools, templates, and processes that guide the parties towards the best outcomes of a negotiation.

Our examples illustrate how automated tools can help elicit information and communicate complex messages clearly and effectively. The use of visual tools can also be instrumental in improving the process of revising contract text in the drafting phase. Drafters – either managers or lawyers – can use pictures to double-check whether the desired meaning and business outcomes are clearly conveyed. By showing paired texts and pictures to colleagues or clients it is possible to “rapidly prototype” whether others interpret the text in the way intended or feel that there is a discrepancy between what is meant and how the text reads.

The demos presented in this paper are encouraging in showing a possible new approach to contract drafting that takes into consideration the value that multimodal communication and enhanced collaboration and transparency can offer. Despite being early prototypes, the demos help raise interesting questions on what a novel drafting process could look like and which opportunities and challenges await those interested in developing and using new tools for producing legal documents. Our results point to the possibility of future document assembly engines incorporating visualizations in the text they generate, thus significantly reducing ‘entry barriers’ for future document designers who want to make the meaning of their contracts visible and the core message easier to find, understand and act upon. The benefits can be great for both lawyers and clients.

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